Narrative Report
Swan Lake National Wildlife Refuge
January - December, 1970

United States Department of the Interior
Fish and Wildlife Service
Sumner, Missouri 64681

C O N T E N T S

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PERMANENT PERSONNEL

Robert H. Timmerman	Refuge Manager
(Vacant)	Asst. Refuge Manager
Marvin F. Lentz	Refuge Clerk
Benny N. Howerton	Med. Equipment Operator
Bennie M. Hull	Biological Technician

PART TIME EMPLOYEES

Floyd A. Holland	Laborer
Roy T. Warren	Laborer
Ervin Windsor	Laborer

NEIGHBORHOOD YOUTH CORPS ENROLLEES

Mike L. Brown	Laborer
Herbert L. Glasgow	Laborer
Frank Przybylski	Laborer

I. GENERAL

A. Weather Conditions

	Precipitation			Max.	Min.
	Month	Normal	Snowfall	Temp.	Temp.
January	.13	1.64	2.50	57	-12
February	.15	1.79	1.50	63	0
March	.66	2.57	2.50	75	16
April	4.94	3.72	-	88	20
May	6.31	4.52	-	89	33
June	3.95	4.87	-	94	50
July	.93	3.92	-	101	46
August	8.29	3.67	-	100	53
September	8.80	4.88	-	92	44
October	3.34	2.72	-	82	30
November	1.80	2.32	-	68	10
December	1.88	1.65	-	67	11
Annual Totals	41.18	38.27	6.50	Extremes 101	-12

This data was collected from the weather station at Fountain Grove, located about eight miles north of refuge headquarters.

A. Weather Conditions

The total precipitation was 41.18 which is only 2.91 inches above 38.27 which is considered normal for this area. The first three months were dry followed by a wet period in April and May. June and July were dry and hot. More than twice the normal amount of rain was received during August and September. The last three months of the period were quite normal except for an almost complete lack of snow.

B. Habitat Conditions

1. Water

During wet periods quite large amounts of water had to be passed through the valves, but the Silver Lake emergency spillway was never topped. The Grand River crested at 35.26' on September 25 and flooded all the moist soil food plants in South and Swan Lakes plus much of the lower farm ground. Yellow Creek was out of its banks several times during the early fall flooding out all the wheat in that portion of the hunting area. Generally speaking however we were able to maintain approved water levels most of the year.

2. Food and Cover

The following table compares food production during the past sixteen years.

Foods Available For Waterfowl 1955-1970

Year	Bushels of Grain*	Acres of Wheat	Acres of Legumes	Acres of ** Moist Soil Foods
1955	11,450	718	-	400
1956	27,330	712	-	400
1957	29,800	967	-	400
1958	14,920	1,267	15	400
1959	34,750	979	212	2,000
1960	16,000	1,250	204	2,285
1961	21,180	223	638	2,200
1962	26,280	687	478	2,200
1963	52,600	667	525	2,200
1964	29,240	775	427	2,200
1965	86,300	660	250	2,200
1966	69,000	1,125	383	2,200
1967	35,000	1,150	-	2,200
1968	101,200	1,124	308	2,200
1969	25,000	2,000	30	1,800
1970	65,000	730	470	2,200

*This includes corn, milo and rice.

**Includes mainly wild millet, chufa, tame millet, and smartweed.

Poor distribution of moisture made this a rather frustrating farming year. An over abundance of rain during corn planting time delayed the operation considerably. This was followed by a hot-dry period during June and July that delayed germination of some milo and caused poor pollenation in corn. The flood during late September covered all the milo and some of the corn making it readily available and attractive to waterfowl about a month earlier than planned.

We were very fortunate to have good clover as it was a losing battle trying to get wheat planted. When we would finally get some planted a flood would come along and drown it out. One field was planted twice from the ground and once from the air, but drownd out all three times. The 730 acres of wheat shown in the previous table was of poor quality. We could never really evaluate the aerial seeding of wheat done on October 1-2. Much of the area became covered with water the day after seeding and consequently produced nothing.

Moist soil plant food production in both Swan and South Lakes was the best I have ever seen. However, we do not know how much of the seed was lost during the September flood. Undoubtedly some of the food floated away, but judging from later waterfowl use some at least remained.

Upland vegetation grew rank and tall. The Area Manager for the State reported mowing the lawn 22 times during the summer.

II WILDLIFE

A. Migratory Birds

Ducks and Coots

No ducks were using the refuge during the first three weeks of the period. Mallards and common mergansers were the first to return. All of the common species had returned by the middle of March and peaked at 18,970.

Our summer population was estimated at 400 wood ducks, 20 mallards, and 20 blue-winged teal. A few wood duck broods and one mallard brood were seen.

Fall duck use was the highest it has been for several years. We had a total of 6,467,020 duck days use this fall as compared to 3,948,980 in 1969 when very little food was available on the refuge. Mallards peaked at 85,000 during the third week in November when the total duck population peak of 99,140 was also reached. Very few divers used the refuge at all this fall.

Total duck days use for the year was 7,230,440. This compares with 5,735,905 in 1969, and 7,467,215 in 1968.

Coots peaked at 5,000 during the spring and 35,000 during the fall. During the period of September to December 987,000 coot use days were recorded which is more than twice the number ever previously reported.

Geese

The Canada goose population on the refuge was low during January. In fact, for short periods we were able to drive them all out and let all water areas freeze over. However, they would only go as far south as the Dalton Cut-Off on the Missouri River and as soon as temperatures moderated they would be right back. On January 21 Dick Vaught counted 96,850 Canada geese in the zone, but only 20,000 of these were at Swan Lake. The temperature did not get above zero that day. We began to harass them at open water areas both here and at Fountain Grove. We were able to drive them out and let the roosting areas freeze. For a few cold days we were rid of the geese, but as soon as the weather warmed up on the 26th about 60,000 moved back up from the Missouri River. The spring peak of 80,000 was reached during the second week in February. By the middle of April all the geese were gone except for about 100 that stayed all summer.

The fall migration began on September 10 with the arrival of 150 Canada geese. This is about ten days earlier than normal. No mass migration occurred but movements took place on September 13, 15, 16, 17, 19 and 30. The birds continued to trickle in until the peak of 113,000 was reached November 8.

Blue and snow geese first appeared on the refuge during the last week in January when 1,000 put in an appearance. The spring peak population of 13,000 was reached during the third week in March. The first five fall migrants were seen on September 22. The peak population of 30,000 was reached in early November. This number remained constant until the last week in December when they finally began to leave. Some of them only went as far south as the Missouri River. It looks as though we may be building a wintering population of blues and snows to further complicate the Canada goose situation.

White-fronted geese did not find Swan Lake attractive at all during the spring migration. We may have had an occasional bird, but no use was recorded. The first five white-fronts were observed on September 22 during the fall migration on the same day the first blues and snows arrived. The peak population of only 30 was reached during the second week in October and none were seen after the middle of November.

The following table compares waterfowl use for the months of September through December for the last sixteen years.

Number of Days Use

Year	Canada Geese	Other Geese	Ducks	Coots	Totals
1955	4,692,100	170,100	7,691,500	90,800	12,644,500
1956	3,390,300	354,900	4,097,700	52,700	7,895,600
1957	2,449,000	36,300	4,289,300	32,450	6,807,050
1958	2,505,700	198,600	2,131,400	14,500	4, 850,100
1959	3,364,825	468,489	4,363,621	373,800	8,570735
1960	5,738,300	358,610	3,400,925	317,435	9,815,825
1961	4,546,580	428,953	4,393,500	85,750	9,454,783
1962	7,113,600	657,300	1,344,350	107,100	9,222,360
1963	8,831,375	969,920	4,677,750	230,300	14,709,345
1964	7,980,700	687,050	4,931,220	175,350	13,774,320
1965	9,122,400	831,180	5,845,560	321,440	16,120,580
1966	11,272,800	1,684,340	6,979,630	398,650	20,335,420
1967	9,774,800	1,578,570	5,792,395	444,500	17,590,265
1968	9,576,700	1,063,825	4,691,960	126,350	15,458,835
1969	6,962,200	547,470	3,948,980	229,110	11,687,760
1970	9,081,450	2,103,220	6,467,000	987,000	18,638,670

Our population figures for Canada geese are based on weekly aerial counts made by Dick Vaught of the Missouri Department of Conservation during the fall and early winter. The remainder of the population estimates are based on ground observations.

See pages 5A and 5B for comparative goose counts on Canada geese.

Swans

Two cygnet swans were seen on Swan Lake on November 24. They looked like two little piles of dirty snow huddled out on the ice in the middle of the lake. Later in the day they were observed on Silver Lake and this was the last we saw of them.

Waterbirds

Fifty white pelicans were first observed April 13 and the peak spring population of 150 was reached April 20. The first 30 fall migrants arrived August 23 and the peak of 1,200 was reached on October 4.

The first cattle egret actually found on the refuge was seen on April 16. They had been seen in the vicinity before but not actually on the refuge.

Shorebirds, Gulls, and Terns

Four Caspian terns were seen over Silver Lake during the middle of September. One immature bird was killed by a vehicle on Highway 139. It had been observed earlier in the day sitting on the road and would

SWAN LAKE COMPARATIVE POPULATION COUNTS

CANADA GEESE

Date	1955	1956	1957	1958	1959	1960	1961	1962
Sept.	2,500	2,500	107	620	100	230	150	8,000
Oct.	55,000	4,600	3,675	41,000	12,650	50,500	24,750	13,325
	96,000	54,850	21,500	44,000	46,350	73,500	48,275	17,628
	133,500*	35,180	36,500	48,000	46,150	86,850	73,600*	74,300
	96,000	35,000	No Count	54,000*	52,000	81,000	70,955	84,000
							70,300	93,000
Nov.	90,000	55,000*	42,000	41,000	57,000*	55,500	71,600	107,950
	No Count	55,000	34,000	31,700	53,555	50,000	62,465	95,000
	57,000	41,000	22,000	19,365	33,905	51,530		118,200*
	49,000	35,000	20,000	19,395	37,055	42,500		
Dec.	21,000	36,000	23,000	14,000	34,620	No Count	54,900	95,200
	15,000	31,745	18,000	20,000	No Count	29,133	39,500	102,500
	12,000	12,000	18,000	20,000	No Count	No Count	38,550	60,900
	28,000 Mo. River							

*Peak Populations

SWAN LAKE COMPARATIVE POPULATION COUNTS

CANADA GEESE

Date	1963	1964	1965	1966	1967	1968	1969	1970
Sept.	1,800	50,025	32,050	35,065	29,450	No Count	9,150	18,425
Oct.	33,725	85,150	57,650	76,425	50,245	43,250	13,700	56,650
	72,895	99,050	90,350	97,525	74,125	68,775	87,050	77,200
	111,800	121,450	106,650	102,775	105,500	81,050	97,500	92,305
	130,225*	115,200	No Count	124,400	No Count	88,100	110,200*	103,090
	115,300	No Count	No Count	138,000*	122,200	110,585		
						113,080		
Nov.	122,000	119,000	89,980	137,050	118,965	137,500*	108,200	106,025
	101,650	76,000	119,350*	126,900	127,265*	125,050	102,860	113,008*
	98,700	88,000	79,750	104,350	108,600	126,475	105,460	109,550
						115,350	93,300	
Dec.	124,150	45,530	82,250	No Count	106,605	No Count	98,770	
	84,650	45,230	110,250	No Count	No Count	122,730		
	56,500	54,065	104,650	123,160	No Count	No Count	82,450	
			86,555					

*Peak Populations

fly up, let a vehicle pass, and land again. One time it didn't make it up in time.

Doves

The doves did not concentrate and dove hunting was not too good in this area.

B. Upland Game Birds

The bobwhite population both on the refuge and in the vicinity is high. Some hunters reported the best season they have had for years.

A few pheasants have been seen in the vicinity, but none on the refuge.

No prairie chicken sightings were made this year. This was very disappointing after the several observations made last year. The field where the pair was seen in 1969 was taken out of corn production and seeded to clover. Many years ago there was a booming ground in this field and we are hopeful that they will use it for that purpose again. We have received no birds for release from the State although they are trying to trap at Whiteman Air Force Base and are trying to trade turkeys for prairie chickens with Oklahoma, Kansas and Nebraska.

C. Big Game Animals

The white-tailed deer population on the refuge remained quite stable at about 325. There was an any deer season in the county this year, but the population was not greatly reduced. We have started a deer movement study that will be discussed later in this report.

D. Fur Animals, Predators, Rodents and Other Mammals

We had no fur animal removal program this year. Raccoons have been the main target of our trapping in the past and do not seem overly abundant.

The beaver colony at the junction of No. 1 and 3 levees is very active. The results of their work can be readily seen by the visiting public and many people get to see them at work in the early evening.

The coyote population is reportedly increasing over this entire general area. The refuge population may be increasing slightly, but not enough to present a problem. We enjoy seeing and hearing them.

Not one fox has been seen all year.

Cottontails are apparently at the low of their cycle. The State cut the bag limit from 10 to six and closed the season February 15 instead of March 1 to see what affect this will have.

Fox and grey squirrel populations were way down. However, with good mast production this year there will probably be a good crop next year.

E. Hawks, Eagles, Owls and Crows

The mid-winter eagle inventory count was 49 and consisted of 18 adult and 25 immature bald, one adult and one immature golden, and 4 unknown. The peak population was probably reached early this year due to a short goose season and a less abundant food supply.

We had only one crippled eagle this year. G.M.A. Sanders broutht a crippled adult golden eagle on December 8. It was eating but was found dead on December 16. It is frozen and will be loaned to some instution for display purposes.

In late September Charley Schwartz was out across No. 5 levee doing some photography on flood damaged crops. He saw an immature peregrine falcon knock a coot out of the air and then drop it. The hawk couldn't find the coot after he dropped it so he flew over and landed in a tree. To see a peregrine falcon here is a rarity, but to see it make the strike is even more unusual. You guessed it. There was no film in any of the cameras.

Short-eared owls were uncommonly abundant this winter expecially during January 1971.

Crows have decreased in numbers the past several years. Many of the roosts that once existed along the Missouri River have been abandoned.

F. Other Birds

An eastern bluebird migration was noted on October 5-6. This is probably nothing significant, but we had never noted it before and several dozen birds were involved.

G. Fish

The refuge was open to fishing March 1 through September 30. This ten day extension of the season did not interfere with refuge operations and will be continued.

Not many channel catfish were taken out of Swan Lake, but Silver Lake provided some nice catches. Some fine catches of crappies were made when water valves were open.

Approximately 18 tons of rough fish were removed during the three day seining season held July 9-11. At least 425 licensed fishermen and probably as many childred took part in the operation on the first day. We probably don't accomplish much as far as rough fish control is concerned but we do provide for a lot of fish fries.

H. Disease

An immature blue goose was picked up as a "spinner" on Swan Lake during goose season. It was taken to the University of Missouri where it was found to have an acute infection of Aspergillosis Fumigatus. No other birds were found in this condition.

Very few lead poisoned geese or mallards were found this year. This was probably due to high water on the bottomland shooting areas.

I. Rare and Endangered Species

As mentioned previously in this report an immature American Peregrine Falcon was observed and photographed on the refuge during late September.

No Northern Greater Prairie Chicken sightings were made during the year.

Although this area lies within the reporting area for the Southern Bald Eagle all our birds are considered to be of the northern race.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

Nothing was accomplished which actually fits in this category. The K-Lane ramp was washed out and rebuilt twice. Riprap was placed in the distribution basin and below the south structure in South Pool to prevent further erosion. A concrete cap was placed to seal a leak that had developed under the south structure of the distribution basin. A considerable amount of dozer work was planned for August and September, but wet weather prevented us from doing it.

B. Plantings

We still have two permittees that farm 200 acres each. We do the remainder of the farming with some help from State personnel. This year we had 800 acres of corn, 150 acres of milo, 470 acres of clover, and 730 acres of wheat. We estimated 65,000 bushels of grain available for the geese.

We had planned to have at least twice this much wheat and rye but wet weather prevented us from getting it planted. Aerial seeding of wheat on October 1 was not too successful due to wet conditions more than the lateness of the date.

C. Collections and Receipts

We obtained all the seed wheat we could get from Clarence Cannon. One semi-trailer load of mixed wheat and Elbon rye was hauled from De Soto. Actually we ended up with much more seed than we could get

planted. The remaining small grain was mixed with shelled corn and used for trap bait.

D. Control of Vegetation

Atrazine was band sprayed on about 700 acres of corn at the rate of one pound per acre primarily for control of giant foxtail. Results varied from near excellent in some fields to very poor in others. We cannot account for the difference unless it was soil moisture content.

Roads were mowed as needed and time permitted. Levees No. 1 and 4 and most of the prairie chicken area were mowed to control brush and sappling growth.

E. Planned Burning

Some burning was planned but never accomplished.

IV FIELD INVESTIGATION OR APPLIED RESEARCH

A. Canada Goose Banding and Fluoroscopy

All trap sites were under water when the first birds of the pre-season sample would normally be taken. We were able to start trapping, with the nets tied back tight, on the Silo trap site on October 7. A temporary trap site was set up south of the White Barn and fired on October 16. Only one shot for the pre-season sample was made on the White Barn site.

A total of 2,910 geese were caught. Of these 668 immatures and 377 adults were banded and fluoroscoped with 1,467 adults released on the trap site. The immature to adult ratio was .36. There were 396 retakes for 13.6 % of the trapped geese. In the immatures 6.28% of the males, 5.34% of the females and 5.83 % of the two combined were carrying shot. In the adults 42.1% of the males, 33.5% of the females and 37.2% of the combined were carrying shot.

The post-season trapping went a lot better than the pre-season. The nets were out a total of ten days to catch the number of immatures needed to equal the pre-season sample. A total of 4,175 geese were caught including retakes. Of these, 654 immatures and 1,205 adults were banded and fluoroscoped (total 1,859) with 1,603 adults released on the trap sites. The immature to adult ratio was .23. There were 563 retakes for 17% of the trapped geese. In the immatures 24.6% of the males, 22.2% of the females, and 23.4% of the two combined were carrying shot. In the adults 37.0% of the males, 41.8% of the females, and 41.8% of the two combined had shot.

We do not have comparable data for 1969 because a lack of immatures made it impossible to catch a significant sample. In 1968 during pre-season trapping 8.3% of the immatures had shot and 16.7% of the

post-season immatures were carrying shot. This year it was 5.83% and 23.4%. This might indicate that hunting pressure was somewhat lighter north of here and a lot heavier after they reached Swan Lake. We do know that the immature to adult ratio in the bag at hunting area headquarters was 4.56 for the entire season which is extremely high. It is hard to believe that for every goose killed north of here there are four killed here at Swan Lake. For some reason these immatures must have been extremely vulnerable.

Something must be done about the feathers and dust at the laboratory when geese are being processed. These are very unhealthful conditions to work under and almost all personnel suffer from respiratory problems. A huge exhaust fan would help to remedy the situation.

Deer Movements Study

The Missouri Cooperative Wildlife Research Unit has begun a study to determine deer movements on the Swan Lake NWR and surrounding areas. The principal investigator is A. David Turner and the advisor is Dr. Rollin Sparrowe. The objectives are to determine the influence of the Swan Lake NWR on the lower Grand River deer population and to determine if deer movement occurs between Swan Lake, Pershing Park (15 miles north), and Fountain Grove Wildlife Area (10 miles northwest).

Deer will be caught in box traps and cannon-nets. Numbered neck collars, ear tags, and ear streamers will be used to mark the deer. Marked deer will be observed and recorded.

At this time (mid-February) over 30 deer have been marked.

V PUBLIC RELATIONS

A. Recreational Use

Recreational use increased more than 10,000 visits over 1969. This was in spite of the shortest goose season on record with less than half the hunters we had last year. During an open-house held October 18 approximately 4,270 persons took the self-guided tour with an additional 550 visitors to the tower before and after tour hours. With facilities to handle them and a little publicity our visitor use would increase tremendously.

B. Refuge Visitors

A list of refuge visitors is on file in the office, but we see no need to report it here.

John Jones and Lyle Miller were here on an inspection May 21. We pointed out several things that were hazzards hoping for suggestions from them. No suggestions were received but the inspection report included these areas as needing attention.

Clair Rollings came on an S&M inspection June 8-9. How does Clair always know just when the mulberries will be ripe?

Dr. Leslie Glasgow took time for a brief tour of the refuge on November 7 when he was in the area for some goose hunting and a D.U. meeting.

Phil Morgan and John Ellis spent November 11-12 on the refuge. This was John's first visit to Swan Lake.

C. Refuge Participation

Only three off-site programs were provided this year. We would a lot rather have them on the refuge where we feel we can better sell our program. Twenty-one groups were provided talks and tours of the refuge.

D. Hunting

The Canada goose season opened Saturday October 24 and lasted sixteen days. This is the shortest season on record for Swan Lake. The quota was 15,000 and the estimated kill was 15,087.

Hunting pressure was the heaviest I have ever seen. Roads were jammed with traffic especially on opening week-end. It took the manager over an hour to get from refuge headquarters to hunting area headquarters on opening morning.

The following pages were taken from the public hunting area report of operations and pretty well cover the subject.

E. Violations

The first Sunday in September the manager apprehended a man for hunting mourning doves from a vehicle and for not having a hunting license. One minute he would be completely cooperative than would switch and be just the opposite. A few days later he was picked up for possession (a pickup load) and sale of marijuana. We didn't realize it at the time but he must have been "high" when we contacted him.

We had more trouble with refuge trespass than I can ever remember having in the past. People just don't seem to believe in signs any more. Maybe if we can continue to contact them and the courts continue to cooperate we can make believers out of some of them.

F. Safety

No lost time accidents accurred during the year. We have 2,086 accident free days through December 31, 1971.

One minor vehicle accident involving a refuge pickup and a fishermans car took place during late July. The refuge pickup was not

IV. HUNTING OPERATIONS

Requests for reservations were handled in the same manner as previous years with the drawing being held on September 15th. A total of 9,181 application cards were in the drawing which was 58 less than last year. Jack Lukehart, Chariton County Prosecutor, did the drawing with state and federal personnel assisting. 288 requests were received after the September 15th deadline and a total of 6,256 sorry cards were sent to those hunters whose request could not be filled. Also, due to the early closure on November 8, 2,301 closure cards were mailed to hunters who were holding late reservations. Comparison on number of application cards in the drawing during the past five years is as follows:

Year	No. of Applications
1970	9,181
1969	9,239
1968	9,156
1967	10,099
1966	9,411

Unclaimed reservations were also handled in the same manner as previous years except they were not quite as numerous as other seasons due to a change in our regulations which reads as follows: "Hunters failing to cancel at least two weeks in advance will not be issued one next year."

The following data shows what effect this regulation had on cancellations compared to the 1969 season during the same period of time:

First Sixteen Days	1969	1970
Total number of reservations issued	912	1,085
Total number of reservations cancelled	53	149
Balance	859	936
Total number of reservations used	691	808
Total number of reservations not used	220	128
Total number of parties on waiting list	500	524
Total number of blinds filled from waiting list	248	146

V. SUMMARY OF THE 1970 Canada Goose Season

One word summarizes the 1970 hunting season, "Short". The season opened one half hour before sunrise on October 24 and ended at sunset on November 8 when a total of 15,087 Canada Geese were harvested in the zone. This was a total of sixteen hunting days and the shortest

season on record. Heavy hunting pressure existed throughout those sixteen days and I am sure there were more hunters in the field tnan any other past season during the same period.

Outside kill was very heavy the first two days and remained good throughout the period. Hunter success on the area was also good and ran from a high of .93 bird per hunter on opening day to a low of .49 on November 3.

On the Swan Lake Area, 3,144 hunters bagged 2,107 Canada Geese, 66 Blue Geese, 84 Snow Geese and 3 White-fronted Geese for an average of .72 bird per hunter. This was an all time low for number of hunters, number of birds harvested and the shortest season since the area was opened in 1955.

81.7 % of the birds killed on the area were examined at headquarters and the immature/adult ratio ran 4.56.

Immatures			Adults		
Males	Females	Total	Males	Females	Total
694	718	1,413	152	158	310

DAILY CANADA GOOSE HARVEST IN THE ZONE - 1970

Date	Canada Geese	Total
Oct. 24	2,832	2,832
Oct. 25	1,948	4,780
Oct. 26	1,248	6,028
Oct. 27	1,013	7,041
Oct. 28	1,063	8,104
Oct. 29	784	8,888
Oct. 30	968	9,855
Oct. 31	795	10,650
Nov. 1	987	11,637
Nov. 2	533	12,170
Nov. 3	341	12,511
Nov. 4	438	12,949
Nov. 5	528	13,477
Nov. 6	555	14,032
Nov. 7	326	14,358
Nov. 8	729	15,087

SWAN LAKE DAILY WATERFOWL SHOOTING RECORD - 1970

Date	No. of Hunters	Canada Geese	B&S Geese	W-F Geese	Total	Cripples	Avg. Kill Per Hunter
Oct. 24	209	180	14		194	21	.93
25	208	157	6		163	31	.78
26	204	169	5	1	175	34	.86
27	194	160	1		161	31	.82
28	196	147	7		154	30	.79
29	195	153	3		156	14	.80
30	192	141	18		159	6	.82
31	201	136	25		161	10	.80
Nov. 1	206	110	8	1	119	10	.57
2	190	135	12		147	18	.79
3	181	84	4		88	8	.49
4	195	108	19		127	6	.65
5	190	102	7		109	9	.57
6	173	112	17	1	130	19	.75
7	200	98	4		102	10	.51
8	210	115	1		116	13	.55
	3,144	2,107	151	3	2,261	270	.71

Swan Lake Canada Goose Kill	2,107
Fountain Grove Canada Goose Kill	1,816
Estimated Outside Canada Goose Kill	11,164
Total Canada Goose Kill in Zone	15,087
Harvest Quota For The 1970 Season	15,000

COMPARISON OF SHOOTING DATA SINCE 1955

Year	Length of Season	Peak Population	No. of Hunters	Canada Goose Kill On Area	Avg. Kill Per Hunter	Outside Kill	Bushels of Grain on Area
1955	53 days	133,500 (10-26)	10,137	8,836	.87	3,727	11,500
1956	70 days	55,000 (11-5)	11,204	3,118	.27	1,140	27,500
1957	70 days	42,000 (11-4)	10,360	3,680	.35	1,075	30,000
1958	70 days	59,500 (10-27)	9,256	6,186	.66	3,410	14,500
1959	70 days	57,000 (10-16)	11,014	5,254	.47	2,425	35,000
1960	31 days	86,850 (10-17)	6,343	6,895	1.08	3,680	16,000
1961	25 days	75,000 (10-16)	3,483	3,356	.96	3,116	21,000
1962	60 days	118,000 (11-21)	9,609	5,506	.57	7,208	26,280
1963	70 days	130,225 (10-21)	9,954	5,890	.59	10,244	52,600
1964	55 days	121,450 (10-19)	9,164	9,069	.98	15,691	29,240
1965	70 days	119,350 (11-8)	10,313	4,624	.44	12,255	86,300
1966	39 days	138,000 (10-31)	6,933	8,015	1.15	18,605	69,000
1967	24 days	127,265 (11-12)	4,216	5,274	1.25	22,669	35,250
1968	70 days	137,500 (11-5)	10,123	5,747	.56	16,518	100,000
1969	55 days	110,200 (10-26)	7,858	4,088	.52	15,615	25,000
1970	16 days	113,008 (11-8)	3,144	2,107	.67	12,980	63,000

VIOLATIONS

Type of Violation	Completed Cases	Total Fines	Court Cost	Pending
Over 10 shell limit	9	$ 135.00	$ 99.00	0
Attempt to take over limit of geese	2	25.00	22.00	1
Hunting outside of assigned blind	5	60.00	22.00	1
Non-resident hunting on resident permit	5	165.00	55.00	2
Hunting on improper permit	1	50.00	11.00	0
Refuge trespass	12	205.00	99.00	3
Shooting duck on refuge	2	10.00	11.00	0
	36	$ 650.00	$ 319.00	7

Year	Season Length	No. of Completed Cases	Total Fines	Court Cost
1967	24 days	79	$ 1,190.00	$ 759.00
1968	70 days	60	1,113.00	660.00
1969	55 days	64	1,320.00	671.00
1970	16 days	36	650.00	319.00

Once again I wish to express my sincere appreciation to all who assisted during the 1970 hunting season and to Bob Timmerman and his staff for their excellent cooperation throughout the year.

Respectfully Submitted,

James A. German

James A. German, Area Manager
Missouri Department of Conservation
Swan Lake Wildlife Area
Sumner, Missouri.

December 1, 1970

damaged and only minor damage was done to the car.

VI OTHER ITEMS

A. Canada Goose Management Discussion Between Region III and IV

Personnel

To promote better understanding of mutual problems in flyway management of Canada goose populations in the Mississippi Flyway representatives from region III and IV got together during March to look at the problem. Three representatives from region IV were given a "show me" tour of Canada goose concentration areas in Missouri, Southern Illinois, and Western Kentucky. The second phase of the meeting involved a halfday conference in Atlanta. A lot was accomplished and we feel that much could be gained from more meetings such as this in the future. To often in the past the people who actually do the management have not been represented at meetings where decisions have been made.

B. NYC Program

During the period of June 8 thru August 21 we had three boys employed under the Neighborhood Youth Corp program. They could not be allowed to operate equipment or vehicles, but did a lot of work cutting brush along levees, painting, yard maintenance etc. We plan to continue the program next year.

C. Credits for Preparation

Mr. Lentz made out NR-1, typed and assembled the report.

D. Photographs

Once again we have a poor photo section due to malfunctioning of the refuge camera. We lost a whole roll of what should have been our best material.

SIGNATURE PAGE

Submitted by:

Robert H. Timmerman
(Signature)
Robert H. Timmerman

Refuge Manager
Title

Date: March 9, 1971

Approved, Regional Office:

Date: MAR 1971

Phillip S. Morgan
(Signature)

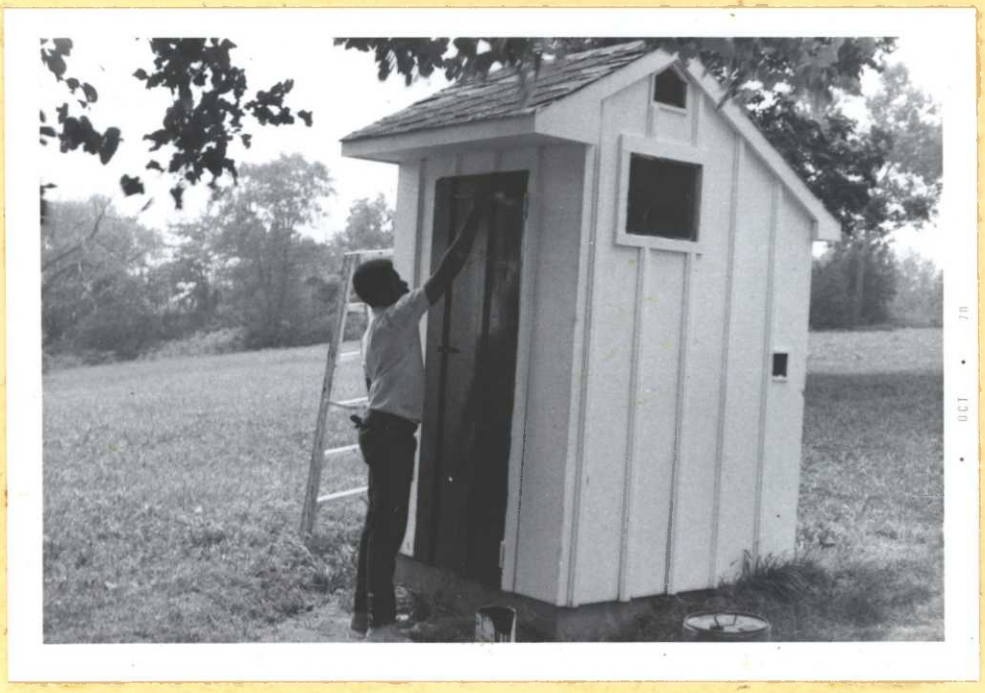
ASST

Regional Refuge Supervisor

NYC employee Herbert Glasgow trying the new flail type mower purchased to replace a worn out rotary mower. It does a good job and is definitely a lot safer than a rotary mower. 1970 Roll 1

Another NYC employee Mike Brown is putting the finishing touches on one of the old "think" shacks in the Picnic Area. These were probably the first negroes ever to work on Swan Lake. 1970 Roll 1


FEB • 71


OCT • 71

The water had badly eroded the area below the south South Pool structure. The hole in the fore-ground was several feet deep.

The area was resloped with the dozer and riprapped to prevent further damage.


FEB • 71


FEB • 71

Fifty P.L. 58602 Chinese chestnut seedlings from Jesse D. Dillar were planted east of the Picnic Area in 1953. Only five of the trees remain. They all have been producing nuts for the past several years. Frank Clark, a local nut tree enthusiast, has been allowed to gather some seed for planting with the understanding that if he is successful in growing seedlings some will be furnished to the refuge. 1970 - Roll 1

This minni-milo was drilled on the north end of Silver Lake levee primarily for winter quail feed. The geese had a different idea. Even though it was only a small field bordered on three sides by trees and brush they moved in and devoured the last kernel long before winter arrived. 1970 Roll 1


FEB • 71


FEB • 71

Some people from Bosworth gave this short-eared owl to the clerk during the open house on October 11. It had a broken wing and died a couple of days later. It was given to Northeast Missouri College for their collection. Timmerman personal.


FEB 71

This is what our trap sites looked like when we would have normally been trapping geese in late September. The Silo trap site is at the top and the White Barn site at the bottom.

Timmerman personal


FEB 71


FEB 71

The top picture shows clover in one of the fields in the middle of September. The bottom picture shows what most of the fields looked like a few days later.

Timmerman Personal


1
FEB 71


1
FEB 71

Dave Turner assisted by Jack Shatford are marking a doe fawn for the movement study. Yellow neck collars are used on does and white expansion collars on bucks. The streamers designate trap site and year of capture. Three men are needed to handle a large deer, but two can get by on fawns.

Timmerman personal


6
JAN • 71 •


JAN • 71 • •

Charley Schwartz was here in late September to shoot film on flood damaged crops. These geese are getting up out of milo that had been covered by water.

Charley Schwartz

These birds didn't want to leave the milo very bad.
Actually the flood did what we had planned to do
only it was a month early and too much water.

Charley Schwartz

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Swan Lake MONTHS OF January TO May, 19 70

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:	1/4 - 10	1/11-17	1/18 -24	1/25-31	2/1 - 7	2/8 - 14	2/15-21	2/22-28	3/1 - 7	3/8 - 14
Whistling										
Trumpeter										
Geese:										
Canada	25,000	25,000	20,000	60,000	70,000	30,000	70,000	60,000	45,000	40,000
Cackling										
Brant										
White-fronted										
Snow										
Blue /				1,000	500	1,000	500	500	3,000	8,000
Other										
Ducks:										
Mallard				800	400	500	1,000	400	800	1,400
Black										20
Gadwall										100
Baldpate										100
Pintail							20	20	50	200
Green-winged teal							20	20	50	150
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										30
Ring-necked									20	200
Canvasback										
Scaup							20	100	50	50
Goldeneye										
Bufflehead										
Ruddy										
Other C. Merganser					50	200	100	300	100	50
H. Merganser										10
Coot:										50

INT.-DUP., D.C.-53824-59

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Swan Lake MONTHS OF January TO May, 19 70

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:	3/15-21	3/22-28	3/29-4/4	4/5-11	4/12-18	4/19-25	4/26-5/2				
Whistling											
Trumpeter											
Geese:											
Canada	40,000	30,000	20,000	10,000	3,000	1,000	200		4,194,400		
Cackling											
Brant											
White-fronted											
Snow											
Blue	13,000	12,000	8,000	3,000	1,000	100			361,200		
Other											
Ducks:											
Mallard	12,000	10,000	6,000	3,000	1,000	200	100		263,200		
Black	100	100	100	50					2,590		
Gadwall	300	4,000	1,000	500	200	50			43,050		
Baldpate	1,000	1,000	500	500	200	50			23,450		
Pintail	1,500	500	200	200	20				18,970		
Green-winged teal	1,300	1,000	700	600	300	80			29,540		
Blue-winged teal		400	2,000	2,500	4,000	2,000	500		79,800		
Cinnamon teal											
Shoveler		8,000	5,000	3,000	2,000	1,000	600		137,200		
Wood	100	500	600	400	400	400	400		19,600		
Redhead	200	150	100	50	50	20			4,200		
Ring-necked	400	700	800	600	200	30			20,650		
Canvasback			100	50	20	10	10		1,330		
Scaup	2,000	3,000	1,000	400	200				47,740		
Goldeneye	10	20	10						280		
Bufflehead	20	30	30	20					700		
Ruddy		40	500	100	30	20			4,830		
Other Com. Merganser	30	50	10						6,230		
Coots: H. Merganser	10	10	100	50					12,60		
	300	1,000	5,000	4,000	2,000	2,000	1,000		107,450		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans				Principal feeding areas Lake margins, wheat fields public
Geese	4,555,600	53,000		hunting area.
Ducks	704,620	18,970		Principal nesting areas
Coots	107,450	5,000		
				Reported by Robert H. Timmerman

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Swan Lake MONTHS OF May TO August, 19 70

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:	5/3 - 9	5/10 - 16	5/17 -23	5/24-30	5/31 - 6/6	6/7 - 13	6/14 - 20	6/21-27	6/28-7/4	7/5 - 11
Whistling										
Trumpeter										
Geese:										
Canada	100	100	100	100	100	100	100	100	100	100
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	20	20	20	20	20	20	20	20	20	20
Black										
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal	20	20	20	20	20	20	20	20	20	20
Cinnamon teal										
Shoveler										
Wood	400	400	400	400	400	400	400	400	400	400
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:	500	200	50							

Int. Dup. Sec., Wash., D.C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Swan Lake MONTHS OF May TO August, 19 70

(1) Species	(2) Weeks of reporting period 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production Broods seen	Broods Estimated total
	7/12-18	7/19-25	7/26-8/1	8/2-8	8/9-15	8/16-22	8/23-29				
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	100	100	100	100	100	100	100		11,900		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	20	20	20	20	30	50	80		3,080		
Black											
Gadwall											
Baldpate											
Pintail						10	30		280		
Green-winged teal											
Blue-winged teal	20	20	20	20	40	100	200		4,340		
Cinnamon teal											
Shoveler											
Wood	400	400	400	400	500	600	600		51,100		
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
									5,250		
Coot:											

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	11,900	100	
Ducks	58,800	910	
Coots	5,250	500	

SUMMARY Lake margins, clover fields,

Principal feeding areas young, corn.

Principal nesting areas

Reported by Robert H. Timmerman

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944.
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Swan Lake MONTHS OF Aug 30,1970 TO Nov 7, 1970

(1) Species	Weeks of reporting period (2)									
	1	2	3	4	5	6	7	8	9	10
Swans:	8/30-9/5	9/6 - 12	9/13 -19	9/20-26	9/27-10/3	10/4-10	10/11-17	10/18-24	10/25-31	11/1-7
Whistling										
Trumpeter										
Geese:										
Canada	100	250	1,000	8,000	18,000	57,000	67,000	93,000	103,000	106,000
Cackling										
Brant										
White-fronted				10	10	20	30	30	20	10
Snow										
Blue				20	300	1,000	5,000	19,000	20,000	25,000
Other										
Ducks:										
Mallard	80	1,200	1,400	2,000	3,000	3,000	5,000	10,000	12,000	20,000
Black										100
Gadwall		1,100	1,200	2,000	2,000	1,000	500	500	400	400
Baldpate	20	1,000	2,000	2,000	3,000	6,000	7,000	10,000	15,000	9,000
Pintail	100	3,000	7,000	10,000	15,000	15,000	12,000	12,000	10,000	10,000
Green-winged teal	20	2,000	3,000	3,000	4,000	4,000	5,000	10,000	12,000	13,000
Blue-winged teal	300	8,000	15,000	20,000	25,000	20,000	15,000	5,000	6,000	2,000
Cinnamon teal										
Shoveler		700	800	1,000	1,000	500	500	500	600	700
Wood	600	1,000	1,000	1,000	1,000	800	700	700	800	900
Redhead										50
Ring-necked										500
Canvasback										
Scaup										2,000
Goldeneye										
Bufflehead										10
Ruddy										20
Other										
Coot:		100	300	9,000	30,000	35,000	25,000	20,000	15,000	5,000

Int. Dup. Sec., Wash., D.C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Swan Lake MONTHS OF Nov 8, 1970 TO Jan 2, 19 71

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Broods: Estimat total
Swans:	11/8-14	11/15-21	11/22-28	11/29 - 12/5	12/6 - 12/12	12/13 - 12/19	12/20- 12/26	12/27 - 1/2/71			
Whistling											
Trumpeter											
Geese:											
Canada	113,000	110,000	110,000	110,000	115,000	97,000	95,000	94,000	9,081,450		
Cackling											
Brant											
White-fronted	10								980		
Snow / Blue	30,000	30,000	30,000	30,000	30,000	30,000	30,000	20,000	2,102,240		
Other											
Ducks:											
Mallard	40,000	85,000	60,000	75,000	70,000	60,000	50,000	30,000	3,698,800		
Black	200	400	300	400	400	300	200	100	16,800		
Gadwall	400	300	50						68,950		
Baldpate	8,000	3,000	500	100					466,340		
Pintail	6,000	4,000	1,000	500	300	300	100	50	744,450		
Green-winged teal	9,000	5,000	800	400	400	300	200	100	505,540		
Blue-winged teal	500	200							819,000		
Cinnamon teal											
Shoveler	400	400	100						50,400		
Wood	900	700	100	100	100	100			73,500		
Redhead	50	2 0							840		
Ring-necked	100	50							4,550		
Canvasback	10								70		
Scaup	300	50							1 6,450		
Goldeneye											
Bufflehead	10	10							210		
Ruddy	30	10		10					490		
Other C. Merganser					20	30	30	10	630		
Coot:	1,000	500		100					987,000		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	11,181,670	143,010	
Ducks	6,467,020	99,140	
Coots	987,000	35,000	

SUMMARY

Principal feeding areas: Corn, Milo and Clover fields.

Principal nesting areas:

Reported by: Robert H. Timmerman

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of January to April 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
White Pelican	50	4/13	150	4/20						
Great Blue Heron	1	4/2								
Cattle Egret	1	4/16								
Common Egret	2	4/27								
Horned Grebe	1	4/14								
II. Shorebirds, Gulls and Terns:										
Killdeer	1	3/4								
Upland Plover	1	4/16								

(over)

(1)	(2)	(3)		(4)	(5)	(6)
III. Doves and Pigeons:						
Mourning dove	Permanent Resident					
White-winged dove						
IV. Predaceous Birds:						
Golden eagle		1	1/15			
Duck hawk						
Horned owl	Permanent Resident					
Magpie						
Raven						
Crow						
Bald Eagle		28	1/5			

Reported by Robert H. Timmerman

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of May to August 195/ 70

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
White Pelican	8/23	30								
Great Blue Heron	Summer Resident		150	August						
Yellow Crowned Night Heron					1	8/26				
Green Heron	Summer Resident				1	8/26				
American Bittern	Summer Resident		25	August						
Sora	2	8/29	1,000	8/31						
II. Shorebirds, Gulls and Terns:										
Killdeer	Summer Resident		100	August						
Upland Plover	Summer Resident		20	August						

No uncommon observations.

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Summer Resident	1,000	August		
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl	Permanent Resident	100	August		
Magpie					
Raven					
Crow	Permanent Resident	100	August		
Turkey Vulture	Seen occasionally	5	June		

Reported by Robert H. Timmerman

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of September to December 1969 70

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
White Pelican	100	9/11	1,200	10/4						
Great Blue Heron					1	12/18				
Black-crowned night Heron	2	9/30								
Sora			Several Hundred	9/20						
II. Shorebirds, Gulls and Terns:										
Caspian Tern	4	9/14								
Franklin Gulls			Thousands in Migration	10/3 -4						
D. C. Cormorant	1	9/11	6	10/9						

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:									
Mourning dove	Summer	Resident	500	September	20	December			
White-winged dove									
IV. Predaceous Birds:									
Golden eagle			3	11/10	2	12/31			
Duck hawk			1	10/2					
Horned owl	Common	permanent	resident						
Magpie									
Raven									
Crow			30	December					
Bald Eagle	2	10/1	50-60	November					
Osprey			1	10/2					

Reported by Robert H. Timmerman

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Swan Lake For 12-month period ending August 31, 1970

Reported by R. H. Timmerman Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
I Swan Lake	Crops	700	Ducks	700,000	0	0
	Upland	200	Geese	5,000,000	0	0
	Marsh	300	Swans	0	0	0
	Water	600	Coots	50,000	0	0
	Total	1,800	Total	5,750,000	0	0
II Silver Lake	Crops	670	Ducks	900,000	40	20
	Upland	1,000	Geese	3,000,000	0	0
	Marsh	530	Swans	0	0	0
	Water	1,800	Coots	180,000	0	0
	Total	4,000	Total	4,080,000	40	20
III South Lake	Crops	830	Ducks	2,800,000	60	60
	Upland	300	Geese	3,900,000	0	0
	Marsh	1,570	Swans	0	0	0
	Water	300	Coots	110,000	0	0
	Total	3,000	Total	6,810,000	60	60
IV River Bottoms	Crops	100	Ducks	312,400	100	100
	Upland	1,650	Geese	177,170	0	0
	Marsh	20	Swans	0	0	0
	Water	30	Coots	1,810	0	0
	Total	2,100	Total	491,380	100	100
TOTALS	Crops	2,600	Ducks	4,712,400	200	180
	Upland	3,150	Geese	12,077,170	0	0
	Marsh	2,420	Swans	0	0	0
	Water	2,730	Coots	341,810	0	0
	Total	10,900	Total	17,131,380	200	180
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.

(5) Production: Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1750c
Form NR-1C
(Sept. 1960)

Waterfowl Hunter Kill Survey

Refuge Swan Lake

Year 19~~6~~ 70

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est.No. Hunters	(9) Est. Total Kill
10/24-10/30	1,398		Canada Geese	1,107			All refuge hunters were checked.	
10/31-11/6	1,336			787				
11/7 - 11/8	410			213				
TOTALS	3,144	15,700		2,107	270*	2,261**		

*Crippling loss based on hunter reports, so is probably not reliable.

**This figure includes 151 blue and snow geese plus three white-fronts that were harvested on the area.

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Swan Lake Months of January to April, 19 70

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob-White									300	
Ring-necked Pheasant										Occasional sightings north of the refuge.
Greater Prairie Chicken										No reported sightings.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Swan Lake Months of May to August, 1970

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White									500	
Ring-necked Pheasant										Several broods reported north of the refuge.
Greater Prairie Chicken										None reported on or near the refuge.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Swan Lake Months of September to December, 19 70

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White									600	
Ring-necked Pheasant										Occasional sightings along north and east boundary.
Greater Prairie Chicken										None observed

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts,etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Swan Lake Calendar Year 1970

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer												325	325	

Remarks:

Reported by Robert H. Timmerman

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Swan Lake Year ending April 30, 1970

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula-tion
[illegible] Raccon				138					138					300
Muskrat				6					6					600
Coyote				2					2					10
Beaver														20
Red Fox														10
Grey Fox														10
Mink				1					1					30
Fox Squirrel														2,000
Grey Squirrel														1,000
Cottontail														1,000
Opossum				7					7					200
Striped Skunk														75
Woodchuck														100
Franklin's Ground Squirrel														50

* List removals by Predator Animal Hunter

REMARKS:

Reported by Robert H. Timmerman

3-1755
Form NR-5
60701

DISEASE

Refuge Swan Lake Year 19

Botulism

Period of outbreak None

Period of heaviest losses

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage)

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life

Remarks

Lead Poisoning or other Disease

Kind of disease None

Species affected

Number Affected Species	Actual Count	Estimated

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

(1)

3-1757
Form NR-7
(Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Swan Lake Year 19 70

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
None													

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Swan Lake County Chariton State Missouri

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Corn	120	8,000			800	56,000		Clover	380
Milo	22	1,100			150	7,000		Wheat	730
Totals	142	9,100			950	63,000		(Waterfowl browsing crops)	
								Fallow Ag. Land	1,110

No. of Permittees: Agricultural Operations 2 Haying Operations _____ Grazing Operations _____

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				
				2. Other				
				1. Total Refuge Acreage Under Cultivation				2,202
Hay - Wild				2. Acreage Cultivated as Service Operation				1,605

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-88
(4/54)

REFUGE GRAIN REPORT

Refuge Swan Lake Months of January through December, 1970

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Shelled Corn	2,000	300	2,300			2,000	2,000	300		300	
Wheat and Rye	360	2,000	2,360		1,800	460	2,260	100		100	

(8) Indicate shipping or collection points

(9) Grain is stored at The White Barn. Corn from Squaw Creek. Wheat from Clarence Cannon. Rye from DeSoto.

(10) Remarks

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: **Swan Lake**

Proposal Number:

Reporting Year: **1970**

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
May - June	Giant Foxtail (Setaria sp.)	Corn fields	700	Atrazine	700 Lbs.	1 lb/acre	Water 7 gal/Acre	Band Spray

10. Summary of results (continue on reverse side, if necessary)

Near excellent results in some fields, and very poor results in other fields. All of the material used was from the same order and the same sprayer was used throughout the operation. The difference may have been in the moisture content of the soil.

35500

-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Swan Lake MONTHS OF Aug 30,1970 TO Nov 7, 19 70

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:	8/30-9/5	9/6 - 12	9/13 -19	9/20-26	9/27-10/3	10/4-10	10/11-17	10/18-24	10/25-31	11/1-7
Whistling										
Trumpeter										
Geese:										
Canada	100	250	1,000	8,000	18,000	57,000	67,000	93,000	103,000	106,000
Cackling										
Brant										
White-fronted				10	10	20	30	30	20	10
Snow										
Blue				20	300	1.000	5.000	19,000	20,000	25,000
Other										
Ducks:										
Mallard	80	1,200	1,400	2,000	3,000	3,000	5,000	10,000	12,000	20,000
Black										100
Gadwall		1,100	1,200	2,000	2,000	1,000	500	500	400	400
Baldpate	2 0	1,000	2,000	2,000	3,000	6,000	7,000	10,000	15,000	9,000
Pintail	100	3.000	7.000	10,000	15,000	15,000	12,000	12,000	10,000	10,000
Green-winged teal	20	2,000	3,000	3,000	4,000	4,000	5,000	10,000	12,000	13,000
Blue-winged teal	300	8,000	15,000	20,000	25,000	20,000	15,000	5,000	6,000	2,000
Cinnamon teal										
Shoveler		700	800	1,000	1,000	500	500	500	600	700
Wood	600	1,000	1,000	1,000	1,000	800	700	700	800	900
Redhead										50
Ring-necked										500
Canvasback										
Scaup										2,000
Goldeneye										
Bufflehead										10
Ruddy										20
Other										
t:		100	300	9,000	30,000	35,000	25,000	20,000	15,000	5,000

. Sec., Wash., D.C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Swan Lake MONTHS OF Nov 8, 1970 TO Jan 2, 1971

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Broods: Estimate total
Swans:	11/8-14	11/15-21	11/22-28	11/29 - 12/5	12/6 - 12/12	12/13 - 12/19	12/20- 12/26	12/27 - 1/2/71			
Whistling											
Trumpeter											
Geese:											
Canada	113,000	110,000	110,000	110,000	115,000	97,000	95,000	94,000	9,081,450		
Cackling											
Brant											
White-fronted	10								980		
Snow											
Blue /	30,000	30,000	30,000	30,000	30,000	30,000	30,000	20,000	2,102,240		
Other											
Ducks:											
Mallard	40,000	85,000	60,000	75,000	70,000	60,000	50,000	30,000	3,698,800		
Black	200	400	300	400	400	300	200	100	16,800		
Gadwall	400	300	50						68,950		
Baldpate	8,000	3,000	500	100					466,340		
Pintail	6,000	4,000	1,000	500	300	300	100	50	744,450		
Green-winged teal	9,000	5,000	800	400	400	300	200	100	505,540		
Blue-winged teal	500	200							819,000		
Cinnamon teal											
Shoveler	400	400	100						50,400		
Wood	900	700	100	100	100	100			73,500		
Redhead	50	2 0							840		
Ring-necked	100	50							4,550		
Canvasback	10								70		
Scaup	300	50							1 6,450		
Goldeneye											
Bufflehead	10	10							210		
Ruddy	30	10		10					490		
Other C. Merganser					20	30	30	10	630		
Coot:	1,000	500		100					987,000		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	11,184,670	143,010	
Ducks	6,467,020	99,140	
Coots	987,000	35,000	

SUMMARY

Principal feeding areas: Corn, Milo and Clover fields.

Principal nesting areas:

Reported by: Robert H. Timmerman

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of September to December 19 70

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
White Pelican	100	9/11	1,200	10/4						
Great Blue Heron					1	12/18				
Black-crowned night Heron	2	9/30								
Sora			Several Hundred	9/20						
II. Shorebirds, Gulls and Terns:										
Caspian Tern	4	9/14								
Franklin Gulls			Thousands in Migration	10/3 -4						
D. C. Cormorant	1	9/11	6	10/9						

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	Summer	Resident	500	September	20	December		
White-winged dove								
IV. Predaceous Birds:								
Golden eagle			3	11/10	2	12/31		
Duck hawk			1	10/2				
Horned owl	Common	permanent	resident					
Magpie								
Raven								
Crow			30	December				
Bald Eagle	2	10/1	50-60	November				
Osprey			1	10/2				

Reported by Robert H. Timmerman

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

59317

3-1750c
Form NR-1C
(Sept. 1960)

Waterfowl Hunter Kill Survey

Refuge Swan Lake

Year 19~~6~~ 70

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est.No. Hunters	(9) Est. Total Kill
10/24-10/30	1,398		Canada Geese	1,107			All refuge hunters were checked.	
10/31-11/6	1,336			787				
11/7 - 11/8	410			213				
TOTALS	3,144	15,700		2,107	270*	2,261**		

*Crippling loss based on hunter reports, so is probably not reliable.

**This figure includes 151 blue and snow geese plus three white-fronts that were harvested on the area.

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Swan Lake Months of September to December, 19 70

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White									600	
Ring-necked Pheasant										Occasional sightings along north and east boundary.
Greater Prairie Chicken										None observed

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Swan Lake Calendar Year 1970

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer												325	325	

Remarks:

Reported by Robert H. Timmerman

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
Form NR-5
60701

DISEASE

Refuge Swan Lake Year 19

Botulism

Period of outbreak None

Period of heaviest losses

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage)

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life

Remarks

Lead Poisoning or other Disease

Kind of disease None

Species affected

Number Affected Species	Actual Count	Estimated

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

(1)

3-1757
Form NR-7
(Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Swan Lake Year 19 70

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
None													

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Swan Lake County Chariton State Missouri

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Corn	120	8,000			800	56,000		Clover	380
Milo	22	1,100			150	7,000		Wheat	730
Totals	142	9,100			950	63,000		(Waterfowl browsing crops)	
								Fallow Ag. Land	1,110
								None	

No. of Permittees: Agricultural Operations 2 Haying Operations _____ Grazing Operations _____

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				
				2. Other				
				1. Total Refuge Acreage Under Cultivation				2,202
Hay - Wild				2. Acreage Cultivated as Service Operation				1,605

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.DUP.,D.C.61-88850

3-1570
NR-88
(4/54)

REFUGE GRAIN REPORT

Refuge Swan Lake Months of January through December, 19~~7~~ 70

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Shelled Corn	2,000	300	2,300			2,000	2,000	300		300	
Wheat and Rye	360	2,000	2,360		1,800	460	2,260	100		100	

(8) Indicate shipping or collection points

(9) Grain is stored at The White Barn. Corn from Squaw Creek. Wheat from Clarence Cannon. Rye from DeSoto.

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge: Swan Lake

Proposal Number:

Reporting Year: 1970

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
May - June	Giant Foxtail (Setaria sp.)	Corn fields	700	Atrazine	700 Lbs.	1 lb/acre	Water 7 gal/Acre	Band Spray

10. Summary of results (continue on reverse side, if necessary)

Near excellent results in some fields, and very poor results in other fields. All of the material used was from the same order and the same sprayer was used throughout the operation. The difference may have been in the moisture content of the soil.

35500